CLAIMS

1. A system for measuring analyte concentration of a chemical or biological substance, said system comprising:

a. a mounting adapter;

b. a test element, said test element being detachably mounted to said adapter;

c. a reagent film immobilized on said test element, said reagent film including at least one internal reference standard;

d. at least one light source attached to said adapter, said source being capable of emitting a divergent light beam with a portion of the light impinging the surface with an angle of reflection greater than the critical angle for the surface, said light beam being effective to stimulate a dual light response from said test element and from said reagent film;

e. at least one photodetector attached to said adapter, said detector being capable of detecting said dual light response, said detector being capable of generating an electronic signal response indicative of said dual light response;

f. electronic circuit means for processing, storing and transmitting said electronic signal response, and controlling said light source.

2. The system of claim 1 further comprising integrated clock means, thereby allowing collection of dynamic data from said dual light response during a specified time period.

3. The system of claim 2 further comprising integrated alarm means for indicating said time period.

4. The system of claim 2 wherein said test element is a multisectional test element comprising a plurality of separation regions and sensing regions.

5. The system of claim 4 wherein said multisectional test element is a perforated multisectional test element.

6. The system of claim 5 wherein said multisectional test element has the number of said sensing regions from 2 to 500.

7. The system of claim 6 wherein said sensing regions are nonreversible.

8. The system of claim 6 wherein said sensing regions are some reversible, some nonreversible.

9. A method for measuring analyte concentration of a chemical or a biological substance, said method comprising the steps of:

a. providing a reagent film with at least one internal reference standard;

b. immobilizing a layer of said film onto a test element, thereby providing a film coated test element;

c. emitting light energy onto a coated test element, wherein said light energy undergoes internal reflection and multiangle scattering inside said test element, said light energy being effective to stimulate a dual reference light response from said coated test element;

d. exposing said coated test element to a sample substance for a specified time period, then removing said exposed test element from said substance, thereby providing a sample test element;

e. emitting light energy onto said sample test element, said light energy being effective to stimulate a dual sample light response from said sample test element;

f. collecting and processing said reference and sample light response data to calculate a light absorption response;

g. utilizing said light absorption response to detect and quantify analyte concentration in said substance.

10. The method of claim 9 further comprising the step of collecting dynamic data from said light absorption response during a specified time period.

11. The method of claim 10 further comprising the step of analyzing said dynamic data for determining initial slope, intermediate slope, and final slope of said light absorption response during said time period.

12. The method of claim 9 wherein said light absorption response is error corrected by normalizing said light absorption response.

13. The method of claim 12 wherein said normalizing is performed according to the formula: $A_{corrected} = A_{sample} - A_{baseline} + (A_{baseline\_at\_}\lambda_{reference} - A_{baseline\_at\_}\lambda_{sample})$.

14. The method of claim 9 wherein said coated test element is a multisectional test element capable of providing a plurality of said light absorption responses, said plurality of said light absorption responses being processed and multiplexed in order to detect and quantify a plurality of analyte concentrations in said substance.